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MODULAR LIVING ENCLOSURE

FIELD OF THE INVENTION

The present invention relates to a modular living enclosure that can be assembled in an existing or new building and connected to building services to support occupancy of a person therein.

BACKGROUND OF THE INVENTION

A modular security cell for confining a prisoner in an existing building is described in US Patent 4 754 584. The cell is formed by assembling substantially identical flat wall and ceiling panels on the existing floor of the building. Furniture and bathroom fixtures, such as a toilet and washbasin, are provided separately from the cell and must be placed into the cell as separate components.

An object of the present invention is to provide a modular living enclosure to support occupancy by a person, such as for example a prisoner, for extended time such as days, months or years.

SUMMARY OF THE INVENTION

The present invention provides a modular living enclosure to support occupancy by a person wherein the living enclosure is assembled from multiple molded plastic enclosure sections in an existing or new building and wherein one or more enclosure sections is/are molded to form certain integral features such as for example only bathroom fixtures and/or furniture features on the enclosure to permit occupancy by a person for extended time, such as days, months or years.

The present invention provides in one embodiment a modular living enclosure comprising multiple enclosure sections that are assembled to define an enclosure floor, four upright side walls, a top wall and door opening when assembled. The enclosure sections preferably comprise a hard, abrasion resistant inner layer that defines the interior surfaces of the cell and preferably comprises ceramic particulates in a fire retardant synthetic resin. The inner layer is backed by a plurality of fiber reinforced, particulate-filled synthetic resin layers to form a wall thickness of the enclosure sections. One or more the layers behind the hard inner layer can include a pigment to impart a color to the layer(s) that is different from that of the inner layer to warn of any penetration of the gel coat layer by a prisoner in the event the enclosure is used to house a prisoner. For example, the inner layer can have a white color, while one or more fiber reinforced layers can be orange in color.

In another embodiment of the invention, one or more of the enclosure sections are molded to include features that form bathroom fixtures and/or furniture features in the living enclosure when the enclosure sections are assembled for use by a person during extended time. For example, a toilet fixture, washbasin fixture, shower, and floor drain can be molded on one or more other enclosure sections and connected to building water and sewer service lines. A bed surface, seating surface, a desk surface and other furniture features can be molded on one or more of the enclosure sections. In an illustrative embodiment, the washbasin and a shower are supplied with water from building water service

lines. The enclosure may include an electrical water heater to provide hot water to the washbasin and shower. The drains of the washbasin and floor drain are communicated to a common sump chamber on the enclosure. The sump chamber is pumped to a building sewer service line. The toilet is connected to a waste disposal device, such as a garbage disposal, that comminutes waste that then is pumped to a building sewer line. A lighting fixture, ventilation fan, monitoring camera as well as temperature control and emergency fire/smoke sprinkler protection devices can be provided on the enclosure and connected to a building electrical service line. A programmable computer control unit can be used to control supply of water to the bathroom fixtures and supply of electrical power to electrical devices on the enclosure.

In a still further embodiment of the invention, the molded enclosure sections include cooperating L-shaped flanges by which the sections are assembled. When joined together, the L-shaped flanges form an upstanding surface on which a fascia panel can be fastened to cover one or more sides of the assembled living enclosure or adjacent living enclosures in the event several living enclosures are arranged in a row.

The above and other objects and advantages of the invention will become apparent from the following detailed description taken with the following drawings.

DETAILED DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of a modular living enclosure pursuant to an illustrative embodiment of the invention.

Figure 2 is a perspective view of the modular living enclosure taken at a different viewing angle.

Figure 3 is a perspective view of the modular living enclosure opened along a central axis to illustrate interior furniture and bathroom features molded on enclosure sections.

Figure 4 is a view of the floor of the modular living enclosure.

Figure 5 is an elevational view of the interior of a front wall, in section, of a modular living enclosure pursuant to another embodiment of the invention.

Figure 6 is an elevational view of the interior of a side wall, in section, of the modular living enclosure of Figure 5.

Figure 7 is a view of the floor of the modular living enclosure taken along lines 7-7 of Fig. 6.

Figure 8 is a view of a side wall of the modular living enclosure taken along lines 8-8 of Fig. 6.

Figure 9 is a view of the side wall of the modular living enclosure taken along lines 9-9 of Fig. 6.

Figure 10 is a sectional view taken along lines 10-10 of Fig. 7.

Figure 10A is an elevational view of region 10 of Fig. 10.

Figure 10B is a section view of region 10B of Fig. 10A.

Figure 11 is a view taken along lines 11-11 of Fig. 7.

Figure 12 is a view taken along lines 12-12 of Fig. 7.

Figure 13 is a partial sectional view taken along lines 13-13 of Fig. 7.

Figure 14 is a partial elevation of the shower drain.

Figure 15 is a sectional view taken along lines 15-15 of Fig. 14.

Figure 16 is a partial elevation of the port hole.

Figure 17 is a sectional view taken along lines 17-17 of Fig. 16.

Figure 18 is a longitudinal sectional view of the lighting fixture.

Figure 19 is a transverse sectional view of the lighting fixture.

Figure 20 is schematic diagram of multiple living enclosures arranged to form a people housing system.

Figure 21 is a perspective view of multiple living enclosures arranged in a building.

DETAILED DESCRIPTION OF THE INVENTION

Referring to Figures 1-4, a modular living enclosure 10 for a person pursuant to an illustrative embodiment of the invention is shown to illustrate the invention but not limit the scope of the invention. The living enclosure 10 is especially useful as a prisoner cell to confine a prisoner for extended time, such as days, months or years in self-container manner in that the enclosure includes bathroom fixtures and furniture features that permit a prisoner to live in the enclosure for extended time. The invention is not limited to use as a prisoner living enclosure (prisoner cell) and can be used as a living enclosure in emergency situations such as fire, floods and the like, as a supplemental living enclosure to supplement an existing housing facility, such as a hospital, dormitory, motel, barracks, home and in any other situation where a further living enclosure is needed.

An illustrative modular living enclosure 10 is shown in Figures 1-4 as comprising a plurality of molded plastic enclosure sections 20a, 20b, 20c, 20d, 20e, 20f that are assembled to define an enclosure floor F, four upright side walls S1, S2, S3, S4, and a

top wall T and a door opening DO when assembled. The floor and portions of the side walls are formed by enclosure sections 20a, 20b. The remainder of the side walls are formed by sections 20c, 20d. The closed top wall of the enclosure 10 is formed by top sections 20e, 20f.

The sections 20a, 20b include molded-on feet 20af, 20bf that are adapted to rest on the floor FL of an existing or new building B, Figure 21, and to be attached to floor FL by suitable fasteners or other means. For example, the horizontal flange portion of the L-shaped feet 20af and 20bf include drilled holes to receive a respective screw SC or other fastener by which the enclosure 10 is fixed to the floor of the building B. The floor FL of the building typically will be concrete such that the fastener FL is selected of the type for use in fastening to concrete. Other building floor materials may be encountered, and the fasteners FL will be selected accordingly. Support legs LL can be positioned under the outside corners of sections 20a, 20b on the building floor FL for further support of the enclosure 10. The support legs can be hinged to the enclosure sections or otherwise attached thereon, or they may be separate support legs positioned between the underside of the enclosure and the building floor.

The section 20a is illustrated as being molded to include an integral bed surface 31, seat or stool surface 32, and shelf surface 33 for use by the occupant of the enclosure. The section 20b is illustrated as being molded to include an integral bathroom washbasin fixture 34, toilet 35, floor drain 37, and a shower head (not shown) on the section 20f above the floor drain 37 to this

same end. The floor of the enclosure is designed to slope toward the floor drain 37 so that the inside surfaces of the assembled enclosure 10 can be sprayed or otherwise washed down with water and/or cleaning solution to clean them and drained through the floor drain 37.

The washbasin, toilet, floor drain, and shower are adapted to be connected to a building water service line and a building sewer line as described below with respect to Figures 5-20. Similarly, electrical lighting fixtures and other electrical devices (not shown in Figures 1-4) provided on the enclosure as described below with respect to Figures 5-20 are adapted to be connected to building electrical service. Figures 1-4 are offered merely to illustrate simplified views of one embodiment of the enclosure sections 20a-20f preparatory to describing a preferred embodiment of the enclosure sections pursuant to the invention. Figure 21 illustrates several living enclosures 10 disposed on floor FL in building B having roof RF. The building B can be a warehouse, gymnasium, garage, or any other new or existing building in which the enclosures can be positioned.

The sections 20a, 20b are molded to include integral molded-on L-shaped flanges 21a, 21b and flat flanges 21aa, 21bb, Figure 3, that are abutted during assembly and fastened together as illustrated in Figures 1 and 2. The flanges 21a, 21b are located on the bottom of each of the sections 20a, 20b. The flanges 21a, 21b can include drilled holes 31, Figure 3, in registry with one another and through which fasteners (not shown but similar to fasteners 38 described below) such as bolts can be inserted and secured with

nuts to join the flanges 21a, 21b together. When assembled together, the flanges 21a, 21b located on the floor regions of the sections 20a, 20b collectively form an intermediate foot between feet 20af, 20bf, Figure 1, for resting on the floor FL of the building. The flanges 21aa, 21bb on the rear side wall region include drilled holes and are similarly joined together by fasteners 38. The flanges 21a, 21b; 21aa, 21bb as well as the other molded-on flanges described below on the enclosure sections alternatively, or in addition, may be clamped or otherwise fastened together. When assembled at the flanges 21a, 21b; 21aa, 21bb, the sections 20a, 20b include a parting line PL1 on the floor F and rear side wall S4 of the enclosure 10. The floor F of the sections 20a, 20b can be molded to include a non-slip interior surface, such as a raised diamond pattern (not shown) on the floor F or any other surface features and/or textures, to provide secure footing.

The sections 20a, 20b also include molded-on curvilinear forwardly facing flanges 22a, 22b on the front side wall S3. The flanges 22a, 22b each include horizontal and upright regions connected by a curved region to form a lower portion of the door opening DO.

The sections 20a, 20b also include molded-on, laterally extending horizontal flanges 23a, 23b that face upwardly. These flanges are adapted to receive the enclosure sections 20c, 20d thereon.

For example, the sections 20c, 20d include horizontal downwardly facing, laterally extending flanges 24a, 24b that rest on upwardly facing flanges 23a, 23b. The flanges 23a, 23b; 24a, 24b extend about the periphery of the enclosure, except for door opening DO,

and include drilled holes through which fasteners 38 such as bolts 38a can be inserted and secured with nuts 38b as described above.

The sections 20c, 20d also include molded-on forwardly extending, upright flanges 25a, 25b on the front side wall S3. The flanges 25a, 25b form an intermediate portion of the door opening DO. The sections 20c, 20d also include molded-on rearwardly extending, upright flanges 26a, 26b on the rear side walls. The flanges 26a, 26b include drilled holes through which fasteners 38 can be inserted and secured with nuts 38b as described above. When assembled, the sections 20a, 20b; 20c, 20d include therebetween a horizontal parting line PL2 on the lateral and rear side walls S1, S2, S4 and an upright parting line PL3 on the rear side wall S4 of the enclosure 10.

The sections 20c, 20d also include molded on horizontal flanges 27a, 27b that face upwardly. These flanges are adapted to receive the enclosure sections 20e, 20f thereon.

For example, the sections 20e, 20f include downwardly facing, horizontal flanges 28a, 28b that rest on upwardly facing flanges 27a, 27b. The flanges 27a, 27b; 28a, 28b extend about the periphery of the enclosure, except for door opening DO, and include drilled holes in registry with one another and through which fasteners 38 such as bolts 38a can be inserted and secured with nuts 38b as described above.

The sections 20e, 20f also include molded-on forwardly extending downwardly facing, horizontal flanges 29a, 29b on the front side wall S3. The flanges 29a, 29b form an upper portion of the door opening DO.

The sections 20e, 20f also include molded-on upwardly extending, upright flanges 30a, 30b on the top wall T. The flanges 30a, 30b include registered drilled holes through which fasteners 38 can be inserted and secured as described above. When assembled, the sections 20c, 20d; 20e, 20f include therebetween a horizontal parting line PL4 on the lateral and rear side walls S1, S2, S4 and a parting line PL5 on the top wall T of the enclosure 10.

When the enclosure sections 20a-20f are assembled as described, living enclosure 10 is formed having enclosure floor F, four upright side walls S1, S2, S3, S4, a top wall T and a door opening DO. A door (not shown) can be hinged or otherwise fastened on the enclosure to close off the opening DO. The door is not shown in Figures 1-4 for convenience in illustrating interior features of the enclosure 10. The door can be hinged on the upright jamb surfaces of the flanges 22a, 22b and 25a, 25b defining the opening DO. The door can be provided with a suitable shape to close off the opening DO and a conventional lock or latch mechanism (not shown) to cooperate with a lock or latch mounted on the enclosure 10.

Although not shown in Figures 1-4, a decorative fascia panel can be attached to the side walls S1, S2, S3, S4 to hide the joined flanges 23a, 23b; 24a, 24b; etc. and exterior surfaces of the sections 20a-20f from view. The flanges 23a, 23b; 24a, 24b; 27a, 27b; 28a, 28b; 29a, 29b can be molded to have an L-shape as illustrated in Figure 10A to provide an upright surface to which an upright decorative fascia panel can be readily attached as described below with respect to the embodiment of Figures 5-20. The fascia panel P can be molded to include layers R1-R4 described

below, or it can comprise any suitable panel material.

The enclosure sections 20a-20f each are molded to have a wall W having an inner abrasion resistant, ceramic particulate-filled gel coat layer R1 defining an interior surface of said enclosure, Figures 1-2, when the enclosure sections are assembled. Each wall W also is molded to include a plurality of fiber reinforced, particulate-filled resin layers behind the hard inner layer R1.

For example, each enclosure section 20a-20f can be made by spraying a suitable plastic material on a respective master mold (not shown) having a configuration to produce each particular enclosure section 20a-20f. For purposes of illustration, each enclosure section can be made by spraying on its master mold in a first step, a first relatively hard, abrasion resistant filled plastic, fire retardant resin inner layer R1 (Figure 10B) using a filled resin system #1 as described in Table #1 through a commercially available two-chamber spray gun (e.g. PRO Series spray gun from manufacturer, Venus Gusmer Inc.) having a static mixer of sufficient length to thoroughly mix filled resin system #1 with a methyl ethyl ketone peroxide catalyst (e.g. High Point 90 by Witco Corporation) as it is sprayed on the surface of the master mold. This mixture (i.e. resin system #1 and catalyst) is then allowed to polymerize or cure to a relatively high hardness; namely, 65 to 75 Barcol Hardness. The filled resin system #1 (step 1) is sprayed to form inner hard gel coat layer R1 to have a nominal thickness of about 0.030 inch. Although spraying is the preferred method of application, filled resin system #1 can be hand catalyzed, mixed, and then brushed on or poured on the surface of the mold and

allowed to polymerized or cure.

A second filled, plastic fire retardant resin layer R2 (Figure 10B) is sprayed on the inner hard layer R1 after it cures using a filled resin system #2 as described in Table #2 through a commercially available two-chamber spray gun (e.g. PRO Series spray gun from manufacturer, Venus Gusmer Inc.) having a static mixer of sufficient length to thoroughly mix filled resin system #2 with a methyl ethyl ketone peroxide catalyst (e.g. High Point 90 by Witco Corporation) as it is sprayed on the surface of the mold. This mixture (i.e. resin system #2 and catalyst) is then allowed to polymerize or cure to a hardness of 50-60 Barcol Hardness. The filled resin system #2 (step 2) is sprayed to form a filled intermediate resin layer R2 to have a nominal thickness of about 0.030 inch. Although spraying is the preferred method of application, filled resin system #2 can be hand catalyzed, mixed, and then brushed on or poured on the surface of the mold and allowed to polymerized or cure.

After the aforementioned mixture forming intermediate filled resin layer R2 has cured, a step 3 involves spraying another plastic layer R3 behind the second layer R2. The third layer R3 is formed by spraying the resin system #2 as described above on layer R2 immediately followed by spraying filled resin system #3 as described in Table 3 and chopped fiberglass fibers through a two-chamber gun of the type described above having a static mixer of sufficient length to thoroughly mix filled resin system #3 with the above catalyst as it is sprayed. This spray gun is also be equipped with a conventional chopper head available from the above

manufacturer to cut the fiberglass gun roving into 1" lengths. Both the chopped fibers and the filled resin system #3 are simultaneously sprayed behind the filled resin system #2 at a preferred ratio of 70% by weight of resin and 30% by weight of chopped fiberglass. The mixture is then rolled out and allowed to polymerize or cure to form fiber reinforced filled resin layer R3. Step #3 described above is repeated three more times to form fiber reinforced filled resin layers R4, R5, R6. Each fiber reinforced filled resin layer R3, R4, R5, R6 has a nominal thickness of about 0.090 inch. The total thickness of the wall W of each cell section is about 0.42-0.43 inch, although other wall thicknesses can be used in practice of the invention. A cross-section through the wall W of a cell section is shown in Figure 10B.

The door described above for closing off opening DO is molded in the same manner as described for sections 20a-20f. The door will comprise inner hard layer R1 with additional layers R2-R5 behind the inner layer R1 as described above for the enclosure sections 20a-20f, and an additional hard outer layer R1 described above.

Table I

Resin System #1

Filled resin system #1 is available as KZ Ceramic Gelcoat from Ceramic Technologies Corporation of Rowley, Iowa and is described in US Patent 5 688 851, the teachings of which are incorporated herein by reference. An illustrative system comprises a mixture consisting of 25% by weight of a commercially available fire retardant, synthetic plastic resin selected from the polyester or vinyl ester group, (although other thermosetting or other plastic

resins may be found suitable), 72% by weight of tabular alumina particles, 2% by weight of wollastonite based product (filler particles) as described in US Patent #4 568 604 and sold under the trademark "KZ6" by Ceramic Technologies Corporation of Rowley Iowa, and 1% by weight Titanium Dioxide. It will be understood by those skilled in the art that the above mixture has been found to be preferred but that deviation from the percents listed or the filler or other constituents used is within the scope of this invention.

Table 2

Resin System #2

Filled resin system #2 comprises a mixture consisting of 48% by weight of a commercially available fire retardant, synthetic plastic resin selected from the polyester or vinyl ester group, (although other thermosetting or other plastic resins may be found suitable), 48% by weight of wollastonite based product (filler particles) as described in US Patent #4 568 604 and sold under the trademark "KZ6" by Ceramic Technologies Corporation of Rowley Iowa, 2% by weight of the mineral Talc, 1% by weight of a hollow microsphere sold under the trademark "Dualite" by Pierce and Stevens Corporation of Buffalo NY, and 1% by weight Titanium Dioxide. It will be understood by those skilled in the art that the above mixture has been found to be preferred but that deviation from the percents listed or the filler or other constituents used is within the scope of this invention.

Table 3

Resin System #3

Resin system #2 comprises a mixture consisting of 71% by weight of a synthetic plastic resin selected from the polyester or vinyl ester group, (although other thermosetting plastic resins may be found suitable), 25% by weight of wollastonite based product (filler particles) as described in US Patent #4 568 604 and sold under the trademark "KZ9" by Ceramic Technologies Corporation of Rowley Iowa, 2% by weight of the mineral Talc, 1% by weight of a hollow microsphere sold under the trademark "Dualite" by Pierce and Stevens Corporation of Buffalo NY, and 1% by weight Titanium Dioxide. An optional pigment such as "Moly-Orange" pigment available from HK Research Corporation can be substituted for titanium dioxide in the mixture in the same amount (1% by weight) to impart an orange color to layers R5, R6 as described below. It will be understood by those skilled in the art that the above mixture has been found to be preferred but that deviation from the percents listed or the filler or other constituents used is within the scope of this invention.

It will be noted that the filled resin system #1, #2 and #3 each contain the catalyst described above so that the layers forming the enclosure section walls W cure on the mold without the need for heating to this end.

The resin systems #1, #2 without chopped fibers and resin system #3 with chopped fiberglass fibers as described above are sprayed on a one piece, open-bottom master mold (not shown) shaped to correspond to a respective enclosure section 20a-20f. The master mold is fabricated of the same material layers as described above

that are sprayed on a respective master wooden pattern. Each fabricated master mold is provided with a draft angle of 1 degree (or other suitable draft angle) to permit removal of each sprayed, cured enclosure section 20a-20f vertically from its master mold out of the open bottom of the mold.

If the enclosure 10 is to be used to house a prisoner (prisoner cell), one or more the layers R2-R5 behind the inner hard layer R1 can include a pigment to impart a color to one or more of the layer(s) R2-R5 that is different from that of the inner layer R1 to warn of any penetration of the inner hard layer R1 by a prisoner. For example only, the layers R1-R4 can have a white color, while an orange (or other color) pigment can be added to resin system #3 used to form the fiber reinforced layers R5, R6 such that those layers have a bright orange color. For example, the above pigment known as "Moly-Orange" pigment available from HK Research Corporation can be substituted for titanium dioxide in the resin system #3 in an amount of 1% by weight to impart an orange color to layers R5, R6 if the enclosure is to be used as a prisoner cell.

Should a prisoner attempt to escape from the enclosure 10 by abrading and/or cutting away the interior surface, the orange color of layers R5, R6 will visually appear and provide a visual alert of such prisoner activity. The high hardness of the inner gel coat layer R1 will make abrasion and/or cutting of the interior of the enclosure difficult and time consuming by the prisoner.

Referring to Figures 5-20, a preferred living enclosure for use in housing a prisoner is shown for purposes of illustration and not limitation. In Figures 5-20, similar reference numerals primed are

used to designate similar features of Figures 1-4. Each enclosure section 20a'-20i' is made by spraying suitable plastic materials described above on a respective master mold of each enclosure section to form the enclosure configuration having wall W' including the above inner hard layer R1 forming the interior surfaces of the assembled enclosure backed by layers R2, R3, R4, R5, and R6.

The enclosure 10' includes a plurality of molded plastic enclosure sections 20a', 20b', 20c', 20d', 20e', 20f', 20g', 20h', and 20i' that are assembled to define an enclosure floor F', four upright side walls S1', S2', S3', S4', a top wall T' and a door opening DO' when assembled. The floor and portions of the side walls are formed by three lower enclosure sections 20a', 20b' and 20g', Figure 7, rather than two sections 20a, 20b of Figures 1-4. The three sections 20a', 20b', 20g' are shown best in Figures 7 and define parting lines PL1A' and PL1B' in the floor and side walls of the enclosure. It is apparent that sections 20a', 20b' are oriented parallel to one another and the front and rear side walls S3', S4' of the enclosure 10' and perpendicular to section 20g'. The remainder of the side walls are formed by four sections 20c', 20d', 20h', 20i' stacked atop sections 20a', 20b', 20g', respectively. The sections 20c', 20d', 20h', 20i' define upright parting lines (e.g. PL3') between one another and horizontal parting lines (e.g. PL2', PL4') with the enclosure sections 20a', 20b', 20g' and 20e', 20f'. The closed top wall of the enclosure 10' is formed by top sections 20e', 20f'. The top sections 20e', 20f' are oriented parallel to the front and rear side walls S3', S4' of the enclosure 10' rather than perpendicular thereto as in Figures 1-4.

The sections 20a'-20i' are connected together by molded-on integral L-shaped flanges 121a', 121b', Figure 10A, rather than the horizontal flanges 23a, 23b; 24a, 24b; etc. of Figures 1-4. The L-shaped flanges of adjacent enclosure sections nest in one another and are fastened together by fasteners 38' comprising bolt 38a' and nut 38b'. A silicone or other sealant (not shown) can be applied between the flanges before assembly. The nested flanges 121a', 121b' define an upright surface 38c" on which decorative fascia panel P', Figure 12, can be mounted for purposes described above. In Figures 5-20, all of the L-shaped flanges on sections 20a'-20g' are designated 121a', 121b' for convenience.

Sections 20a', 20b', 20g' can include molded-on feet (not shown) similar to feet 20af, 20bf (Figs. 1-4) that are adapted to rest on floor FL of building B and to be attached thereto by suitable fasteners or other means as described above. Support legs (not shown) similar to legs LL of Figures 1-4 can be placed under section 20g' and other sections for stability.

The sections 20a', 20b' are illustrated as being molded to include an integral bed surface 31', seat or stool surface 32' for use by the occupant of the enclosure. Section 20c' is illustrated as being molded to form the shelf surface 33' and desk surface 36'. The section 20g' is illustrated as being molded to include an integral bathroom washbasin fixture 34', toilet 35', shower 41', floor drain 37' to this same end. Section 20h' is illustrated as being molded to include shelves 39'. Section 20f' is illustrated as being molded to include a shower 41' formed by integral shower dome or head 41a' having drilled holes 41b' for water discharge. A dome closure 41c' is molded separately and joined to section 20f' as

described below for sump chamber SP'. The floor of the enclosure is designed to slope toward the floor drain 37' so that the shower 41' drains thereto and so that inside surfaces of the assembled enclosure 10' can be sprayed or otherwise washed down with water and/or cleaning solution to clean them and drained through the floor drain 37'.

The bathroom fixtures 34', 35', 37', 41' are adapted to be connected to a building water service line WAT' and a building sewer line SEW' shown in Figure 20 illustrating a plurality of enclosures 10' arranged as a people (prisoner) housing system.

Cold and hot water supply pipes 34a', 34b' extend up the exterior of section 20g' each enclosure 10' to a respective solenoid control valve SO1' and SO2' (or other electrical valve actuator) that are electrically connected to and actuated by a respective "cold" pushbutton B1' and "hot" pushbutton B2' on shelves 39' to dispense cold or hot water to the washbasin 34'. That is, pushbutton B1' actuates solenoid SO1' to dispense cold water. Pushbutton B2' actuates solenoid SO2' to dispense hot water. The pipes 34a', 34b' are passed from the solenoid control valves through the molded-on shelves 39' to a conventional water dispensing spigot 34c' located above the washbasin 34'. Solenoid control valves SO1', SO2' are under control of a computer control unit CPU associated with each enclosure 10' to provide a programmed "on" time of water flow after either buttons B1' or B2' is actuated. The supply pipes 34a', 34b' are connected to the building water supply line WAT'. A commercially available electrical hot water heater HT' is disposed

on the outside of section 20g' and connected to hot water supply pipe 34b' to provide hot water at a preset temperature (e.g. 104 degrees F).

The washbasin 34' is connected by a drain pipe 34d' to a sump chamber SP' formed on the bottom of the section 20g' below the floor drain 37', Figure 12. The sump chamber SP' is molded of resin layers R1-R4 separately and then joined to the bottom of section 20g' by pressing it on the uncured bottom of section 20g' during manufacture thereof. The sump chamber can include an access cover (not shown) fastened thereto to provide access for maintenance. In lieu of sump chamber SP', a larger sump pan (not shown) can be provided under the enclosure 10' to collect waste water from the washbasin and shower for pumping out periodically by a sump pump.

The floor drain 37' drains into the sump chamber SP' via a perforated drain cover 37a' and drain trap 37b' shown in more detail in Figures 14-15. The drain cover 37a' is fastened by fasteners 37c' and sealed by annular seal 37d' to the drain trap 37b'. The drain trap 37b' includes a side opening 37e' that drains water to the sump chamber SP'. A sump pump PP' is disposed in the sump chamber SP' to pump the water therein via drain pipe DP' to the building sewer line SEW'. The discharge water from the washbasin 34' and shower 41' is thereby drained from the enclosure 10'.

The shower 41' includes shower head 41a' formed in the wall of section 20f' with a plurality of holes 41b' drilled in the wall to form discharge openings to form a shower spray. The shower 41' is supplied with heated water from hot water pipe 41d' connected to the hot water heater HT' that also supplies hot water to spigot

34c'. The shower 41' is actuated by a prisoner pressing a pushbutton B3' that actuates a solenoid control valve SO3' connected to pipe 41d'. The solenoid control valve SO3' is controlled by the CPU of each enclosure to provide a shower spray for a programmed time after the pushbutton B3' is pressed.

The toilet 35' includes depending tubular toilet drain or discharge section 35a' that is connected to an electric garbage disposal 42' by a commonly used garbage disposal mounting flange (not shown) disposed on the section 35a'. The garbage disposal 42' comminutes waste from the toilet 35' and can be a commercially available industrial size garbage disposal to this end. A water supply pipe 35b' is connected to an annular pipe 35c' incorporated on the toilet 35' and drilled to include water discharge holes that provide water to the toilet 35' for toilet flushing. Pipe 35b' is connected to building water supply line WAT'. The water supply pipe 35b' includes a solenoid control valve SO4'. The water flushing action is begun by a prisoner pressing pushbutton B4' connected to solenoid valve SO4' and controlled by CPU to provide a programmed flush time. The garbage disposal 42' includes a discharge pipe 42a' connected to building sewer line SEW', Figure 20.

The toilet section 35a' is molded of resin layers R1-R4 separately and then joined to the bottom of toilet 35' by pressing it on the uncured bottom of toilet 35' during manufacture of the enclosure section 20g'. The pipe 35c' is captured on the toilet 35' during the resin spraying operation for example by placing the pipe 35c' on layer R2 and then spraying layers R3-R6 on the pipe. A plurality of holes then are drilled through layers R1, R2 and into

the pipe 35c' such that flushing water is directed into the toilet 35' when the solenoid control valve SO4' is actuated.

Each enclosure 10' typically includes its own CPU to control various electrical devices provided thereon as described below and connected to building electrical service. The individual CPU's may communicate with a central management supervisory computer control unit (not shown). Although Figure 20 illustrates a single CPU for controlling a plurality of enclosures 10' arranged to provide a people housing system, this showing is provided for sake of convenience only. As mentioned, each enclosure 10' typically will include its own individual CPU, although a single common computer control unit can be used in practice of the invention as illustrated in Figure 20 to monitor and control the electrical devices of more than one or all enclosures 10'.

A conventional fluorescent lighting fixture 44' having fluorescent light bulb 44a' is provided on section 20f' to provide interior lighting to enclosure 10', Figures 18-19. Section 20f' includes a molded-on fixture support box 20j' in which the fixture 44' is disposed as illustrated in Figure 19. A transparent Lexan plate 46' separates the lighting fixture from the interior of the enclosure 10'. A cover plate 47' is fastened to the top flange of the box 20j' by fasteners 48' and holds side plates 47a' fastened by fasteners 45' on box 20j' against the plate 46' should transparent plate 46' be pushed upwardly by a prisoner. The lighting fixture 44' is controlled by CPU to provide light for a pre-programmed times of the day and night.

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An electrical ventilation fan 50' is provided on section 20e', Figure 11, and typically operates all of the time to ventilate enclosure 10', except in case of an alarm from thermocouple 52' and/or smoke detector 53'. Section 20e' includes a plurality of holes 51' drilled in the wall W' thereof to form air discharge openings for the ventilation fan. A plurality of air inlet openings 51a' can be provided from under the desk surface 36' for inlet air. The temperature of the enclosure 10' thereby assumes the temperature of the building B in which it is located. A thermocouple 52' can be provided on enclosure 10' to detect interior temperature using a thermocouple probe extending through a drilled hole in the adjacent enclosure wall. A smoke detector 53' can be provided on the enclosure 10' to detect smoke via one or more drilled holes in the adjacent enclosure wall. The CPU activates a solenoid water control valve S05' connected to water sprinkler pipes 54a' in turn connected to building water supply line WAT' in the event interior temperature exceeds a pre-programmed maximum value and/or smoke is detected. Pipes 54a' are captured on the tops of sections 20e', 20f' between layers R2, R3 of each section 20e', 20f' during spraying by placing each pipe 54a' on layer R2 and then spraying layers R3-R6 thereon. The walls of sections 20e', 20f' include a plurality of holes 55' drilled therein and then into the pipes 54a' such that sprinkler water is directed through openings 55' into the enclosure 10' when the solenoid control valve S05' is opened by CPU. The floor drain 37' can drain any sprinkler water from the enclosure.

A conventional monitoring camera 56' can be mounted on section 20e' to monitor a prisoner in the enclosure 10'. The camera 56' can

mounted on section 20e' in a manner as described above used to mount the lighting fixture 44' on the enclosure. A conventional speaker and microphone (not shown) can be provided on the wall of the enclosure 10' to allow communication with the prisoner via drilled holes in the adjacent enclosure wall.

An emergency signal switch button BS' can be mounted on the interior of the enclosure 10' and be operable by a prisoner in the event of an emergency situation. The button BS' can be connected to CPU to alert a guard to the emergency situation.

A door D' is hingedly mounted by hidden hinges H' on the enclosure to close off door opening DO' of each enclosure 10'. The door opening DO' is defined between bottom sill 20s' and top sill 20t', Figure 13, and left side jamb 20l' and right side jamb 20r' looking at the door from the outside of the enclosure 10'. The door D' can be molded as described above for the enclosure sections and can have a hard inner layer R1, layers R2-R5, and an additional hard outer layer R7 like hard layer R1. Alternatively, the door can comprise other materials such as metal. The door is provided with a suitable shape to cooperate with the door sills/jambs to close off the opening DO' and a conventional lock mechanism (not shown) to cooperate with a conventional solenoid-actuated lock (not shown) mounted on side S3' of enclosure 10' and controlled by CPU. The door D' can be provided with a pass-through slot DS'.

The enclosure 10' can be provided with a port hole window 60' on front side wall of section 20c', Figure 5, to permit viewing of the prisoner inside the enclosure 10'. The section 20c' can be molded to include a cylindrical flange 20k' to receive a window pane 61'

comprising a transparent Lexan plate. The pane 61' can be trapped between an annular shoulder on the flange 20k' and an annular flange 63' provided on the fascia panel P', Figures 16-17. A similar port hole window can be provided on the door D', Figure 5.

Figure 20 illustrates a people (prisoner) housing system comprising a plurality of individual modular living enclosures 10' described above arranged in rows with the fascia panels P' omitted for convenience. A central CPU is shown for sake of convenience connected to the electrical fixtures and other devices of several enclosures 10' to control them in programmed manner as described above, although each enclosure 10' typically includes its own CPU to this end. The CPU of each enclosure 10' also is connected to the solenoid control valves S01'-S05' of that enclosure 10' to control water flow in programmed manner as described above. The building water supply line WAT' and sewer pipe line SEW" are illustrated connected by "T" pipe sections T1', T2' to the water supply pipes and sump pumps/garbage disposals, respectively, of adjacent enclosures 10' for purposes of illustration. Other enclosures can be similarly connected to lines WAT' and SEW". The "T" pipe sections can simply rest on the floor F of the building or catwalks (not shown) can be built over the pipe sections.

Although the invention has been described with respect to certain specific embodiments, it is not limited thereto and can be modified and changed within the scope of the appended claims.